

REMARKS/DISCUSSION OF ISSUES

Claims 1, 3 and 4 are in the application. Claims 1, 3 and 4 are rejected.

1. Claims 1 and 3 are rejected under 35 USC 103(a) as being unpatentable over Verschueren in view of Whitman et al.

Claims 1 and 3 are rejected under 35 USC 103(a) as being unpatentable over Verschueren in view of Whitman et al. (herein 'Whitman').

Verschueren discloses a high-pressure discharge lamp with a heat shield for influencing the heat balance of the discharge tube. See col. 1, lines 14, 15. The invention lies in the construction of the heat shield, which results in a reduction of the spread of the cold spot temperature. See col. 1, lines 51-59. The outer tube of the lamp shown in Fig. 1 to illustrate the invention happens to have a tubular shape. However, there is no teaching or suggestion that the particular shape of the outer bulb has any particular advantage for the invention or otherwise. Moreover, Verschueren does not teach or suggest the application of any coatings of any type to the surface of the outer bulb.

Whitman discloses incandescent lamps with a light-scattering coating. Fig. 1(a) shows an incandescent lamp 10 having a tubular quartz envelope 12 with a filament 14 sealed therein. The outer surface 22 is coated with a light-scattering coating 26.

Whitman's lamp 10 is incandescent, so it is not surrounded by an outer bulb in the manner of high-pressure discharge lamps such as those of Applicant and Verschueren. Thus, Whitman's light-scattering coating 26 is not located on an outer bulb, but directly on the outer surface of lamp 10.

Other structures shown by Whitman, in Figs. 2(a), 2(b), 2(c) and 3, all show incandescent lamps mounted within parabolic reflectors (48,72). In Figs. 2(a), 2(b) and 2(c), light-scattering layers are provided in combination with light-reflecting interference filters on the walls of the parabolic reflectors. In Fig. 3, the opening of the parabolic reflector is covered with a lens having an exterior light-scattering coating.

There is no teaching or suggestion by Whitman of a high-pressure discharge lamp with an outer envelope, and the skilled artisan would not be led to apply teachings regarding lamps and structures of very different types to a high-pressure discharge lamp.

The Examiner states that it would have been obvious in view of the teachings of Whitman to provide a light-scattering layer on the outer bulb of Verschueren for the purpose of diffusing the light source image, as taught by Whitman (col. 2, lines 5-10).

However, Verschueren does not teach or suggest the desirability of applying coatings of any type to the surface of the outer bulb. Since Whitman's coatings are applied to parabolic reflectors and lenses for incandescent lamps, and does not suggest the desirability of applying such coatings to other lamp types or structures, it would not be obvious in view of Whitman to add coatings to the outer bulb of Verschueren's lamp, and certainly not to Applicant's outer bulb having a tubular shape.

Accordingly, it is urged that the rejection is in error and should be withdrawn.

2. Claim 3 is rejected under 35 USC 103(a) over Verschueren in view of Whitman and further in view of Kinczel et al. (herein 'Kinczel') and Thornton

Claim 3 is rejected under 35 USC 103(a) over Verschueren in view of Whitman and further in view of Kinczel et al. and Thornton. Both Kinczel (col. 7, line 55 - col. 8, line 16) and Thornton (col. 3, line 67 - col. 4, line 2) are cited to show electrostatic coating processes for light-scattering layers.

Kinczel describes in the referenced passage the structure of the high-pressure mercury vapor gas discharge lamp of Fig. 5, including a luminescent coating 2 consisting of one or two layers, which can be prepared by electrostatic methods. There is no mention of a light-scattering layer, or that the layer or layers of coating 2 have light-scattering properties. Moreover, there is no mention of an electrostatic coating process for a light-scattering layer.

Thornton also describes a high-pressure mercury vapor lamp with phosphor materials coated as a layer 34, using a liquid coating technique or a dry electrostatic precipitation technique. Thornton also mentions with reference to Fig. 3 a layer 42 of a light-scattering material. Significantly, there is no mention of any coating technique for layer 34 (col. 4, lines 18-25).

Thus, neither Kinczel nor Thornton teach or suggest a light-scattering layer produced by an electrostatic coating process, and accordingly, it is urged that the rejection is in error and should be withdrawn.

3. Claim 4 is rejected under 35 USC 103(a) over  
Verschuieren in view of Whitman and further in view of newly  
cited Carleton (U.S. patent 5,008,583)

Claim 4 is rejected under 35 USC 103(a) over Verschuieren in view of Whitman and further in view of newly cited Carleton (U.S. patent 5,008,853). Carleton (col. 1, lines 24-30) is cited to show that the outer bulb of a high-pressure discharge lamp is internally provided with a light-scattering layer.

However, the outer bulb cited by Carleton at col. 1, lines 24-30 is ovoidal (line 27), not tubular, as claimed in Applicant's invention. Moreover, Carleton goes on to explain in detail the disadvantages of such a light-scattering layer, and provides a lamp with a clear outer envelope to overcome these disadvantages. See, e.g., col. 2, lines 8-10.

Thus, not only does Carleton fail to suggest the use of a light-scattering layer on the outer bulb, Carleton actually leads the skilled artisan away from such a light-scattering layer.

One of the reasons Carleton gives for avoiding such a light-scattering layer is that it necessitates an ovoidal or similar-shaped envelope, in order to maintain an acceptable operating temperature. See col. 1, lines 57-61.

Thus, Carleton teaches that light-scattering layers cannot be employed on outer envelopes having shapes other than ovoidal or similar shapes. Thus, Carleton at least strongly suggests that light-scattering layers cannot be used on tubular outer envelopes like those of Verschuieren and Applicant.

In contrast, Applicant's claims specifically call for a tubular-shaped outer envelope. As pointed out in Applicant's

specification, although this leads to a higher thermal load on the coating, it has been found that this has no adverse effects on the service life of the lamp. See page 2, lines 6-8.

Whitman relates to incandescent lamps and parabolic reflectors for such lamps, and thus is not relevant to the field of high-pressure discharge lamps.

Thus, the combination of Verschueren, Whitman and Carleton under Section 103(a) fail to suggest a lamp with an outer envelope of a tubular shape and an internal light-scattering layer, as called for by claim 4. Accordingly, it is urged that the rejection is in error and should be withdrawn.

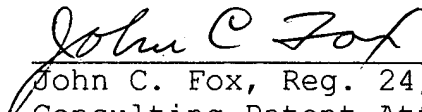
In summary, the cited references, whether taken alone or in combination, fail to teach or suggest a high-pressure discharge lamp with an outer envelope of a tubular shape and a light-scattering layer. Verschueren teaches a high-pressure discharge lamp with a tubular outer envelope, but without any light-scattering layer. Whitman relates to incandescent lamps in parabolic reflectors. Carleton relates to high-pressure discharge lamps, but teaches that a light-scattering layer can only be used with ovoidal or similar-shaped outer bulbs, in order to maintain acceptable operating temperatures, and that such a layer is disadvantageous for other reasons as well. Carleton specifically rejects the use of a light-scattering layer in favor of a clear outer bulb.

Applicant's invention is thus not obvious in view of the various combinations of references provided in the rejections. Moreover, Applicant's invention is particularly unexpected and surprising in view of Carleton, since Applicant combines a tubular-shaped outer bulb and a light-scattering layer, without incurring an unacceptable thermal load.

In view of the foregoing, Applicant respectfully requests

that the Examiner withdraw the rejections of record, allow all the pending claims, and find the application to be in condition for allowance.

Respectfully submitted,

  
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